Project Code and Title

B.02.01.08 Trauma Prediction from Crash Events

Project Objective

To develop a basic understanding of injury patterns associated with different types and severities of motor vehicle crashes and to utilize this knowledge to supplement ongoing emergency medical triage procedures and medical care.

Background

According to a 1988-1990 report on the National Accident Sampling System/ Crashworthiness Data System, approximately:

- 200,000 occupants of passenger vehicles are hospitalized each year as a result of police-reported traffic crashes.
- 935,000 occupants were transported to a medical facility and released.
- 240,000 occupants were treated at the scene.

Problem Definition

Approximately 40,114 people lost their lives in motor vehicle crashes in 1993. Another 3.1 million people were injured. The hypothesis of this project is that emergency medical care to these injured persons can be improved both at the scene of the emergency event and at the hospital through a better understanding of the association of injury patterns with specific crash and vehicle damage scenarios. First responders and emergency medical personnel will be able to make better judgments regarding triage procedures and the identification of injury patterns and occult injuries.

Research Approach

1. Conduct a literature search of available papers and reports on types and degrees of trauma injury resulting from motor vehicle crashes.
2. Use FARS, NASS and other databases to determine if there is any correlation between certain types of injury and certain crash conditions. The correlations will be attempted using parameters that are associated with the dynamic conditions during the crash and, also, with parameters that can only be obtained at the crash scene.

3. The first set of parameters will be utilized to establish an algorithm in coordination with the Automatic Collision Notification (ACN) project being conducted by the Office of Crash Avoidance Research. The algorithm will provide for the efficient notification of a vehicle crash, including the location of the crash, the level of severity of the crash, and an estimate of the possible injury consequences. Parameters could include delta v, direction of force, rollover, restraint usage, door openings, and seating location.

4. The second set of parameters based on information available at the scene of the crash. Injury patterns and severity will be documented for crash and occupant variables that EMTs or other first responders can readily observe at crash events. Parameters could include vehicle characteristics, vehicle damage (exterior and interior), crash severity measures, direction of force, area of damage/intrusion, restraint usage, etc.

   In addition to linking crash parameters to overall injury patterns and severity, particular attention will be directed at crash parameters that may indicate the presence of occult injuries.

5. Work with the emergency medical services community to analyze crash and injury data and in updating the existing trauma triage algorithms based on the results of this study.

Potential Impact/Application

The causes of injuries sustained by people in motor vehicle accidents need to be re-evaluated and analyzed to determine if there is a relationship between certain crash characteristics and injury patterns and severity.

The proposed tasks will identify injury trends and will attempt to correlate these injury patterns with specific crash dynamics and patterns. It is expected that the results of this study will add to first responder's, emergency medical technician's, nurses's and physician's knowledge base on injury patterns and assist them in their treatment of persons injured in motor vehicle crashes. It is expected that these results may be considered in updating the Trauma Triage Algorithms developed by the American College of Emergency Physicians (ACEP) and the American College of Surgeons (ACS).

RESOURCE REQUIREMENTS	**FY96**	**FY97**	**FY98**	**FY**	**FY**
Contract Money ($K)	275	200	200		

Project Manager(s)

Daniel Cohen (202) 366-6652, Dan.Cohen@NHTSA.DOT.GOV

Completion Date

1998

Keywords: Trauma Research, Triage, NASS, FARS, Injury, Fatality, Emergency Medical System, EMS

Project Tasks

Task	**Title and Description**
Task 1a	Literature Search
Task 1b	Abstract Review
Task 2	Update and Extend Champion Paper
Task 3	Injury and Fatality Analysis of Agency Accident Data Files
Task 4	FARS Analysis
Task 5	Emergency Medical Community Involvement
Task 6	Distribution of Findings to the Medical Community

Task	**Start Date**	**Projected Completion Date**	**Status/Responsibility**
1a	8/95	8/95	Completed - Inhouse Staff
1b	11/95	1/96	Completed - Inhouse Staff
2	9/95	4/96	Completed
3	2/96	TBD	
4	1/96	TBD	
5	4/96	TBD	
6	TBD	TBD	Future Work

Supporting Contracts

Task	Contract Number	COTR (phone)	Contracting Officer (phone)	Total Contract Cost ($K)
3		D. Cohen, 202-366-6652		100
3,5		L. Lombardo, 202-366-6208		200